

⁽¹²⁾ UK Patent Application ⁽¹⁹⁾ GB ⁽¹¹⁾ 2 228 510 ⁽¹³⁾ A

(43) Date of A publication 29.08.1990

(21) Application No 8903204.9

(22) Date of filing 13.02.1989

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(51) INT CL⁶
E01F 13/00, E04H 17/00

(52) UK CL (Edition K)
E1G GLJ G702

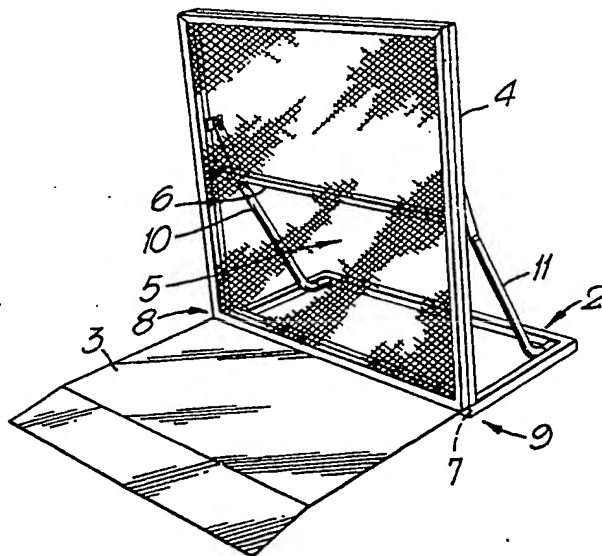
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(58) Field of search
UK CL (Edition J) E1B, E1D, E1G, G5C
INT CL⁴ E01F, E04H

(54) Crush barrier

(57) A crush barrier comprises a first frame extending substantially vertically to form the barrier, a second frame extending substantially horizontally adjacent one side of the barrier to form a ground support, the second frame being connected to the first frame, and a plate (3) which lies adjacent the ground on the opposite side of the vertical frame from the second frame. The plate is connected to one of the frames and forms a platform upon which people may stand. The weight of the people standing on the plate prevents the barrier from being pushed over. When not in use the barrier may be collapsed to a compact form which facilitates storage and transportation.

Fig.2.



At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

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Fig.1.

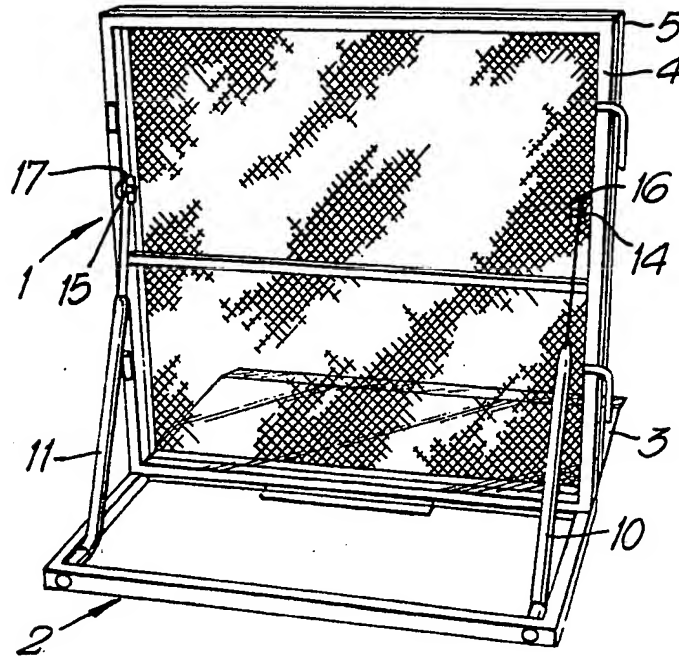
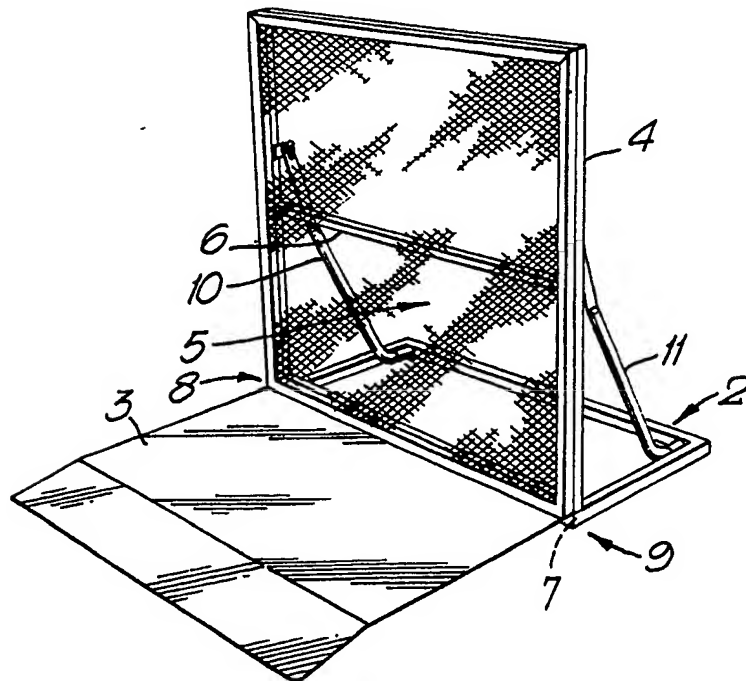


Fig.2.



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Fig. 3.

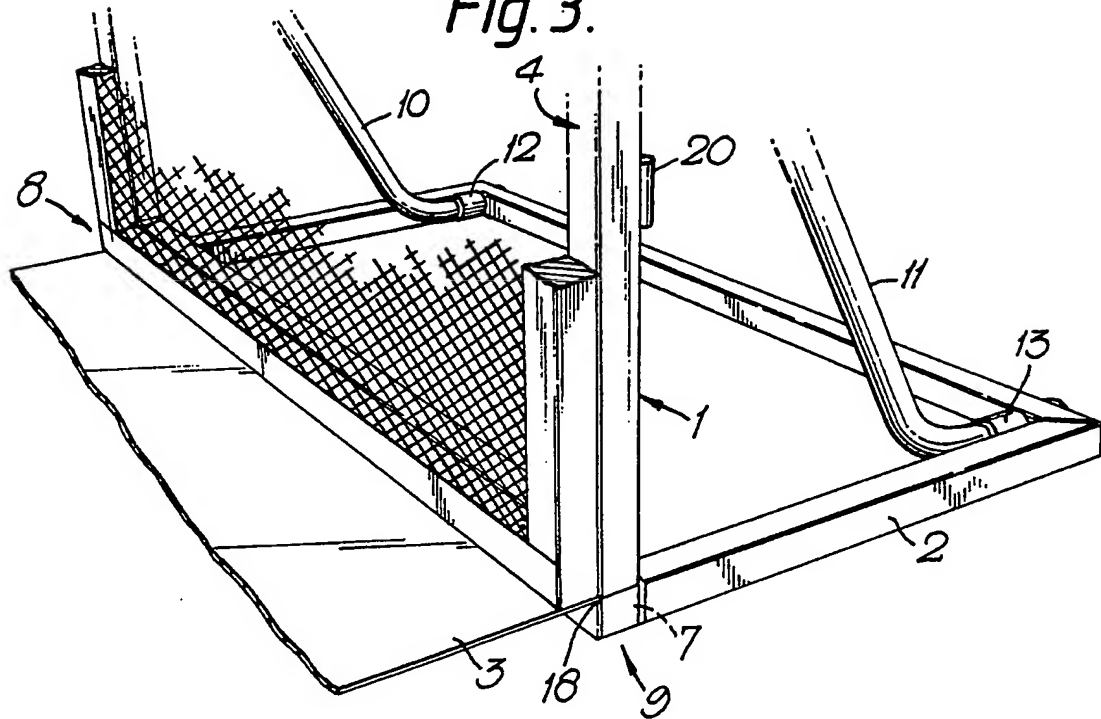


Fig. 4.

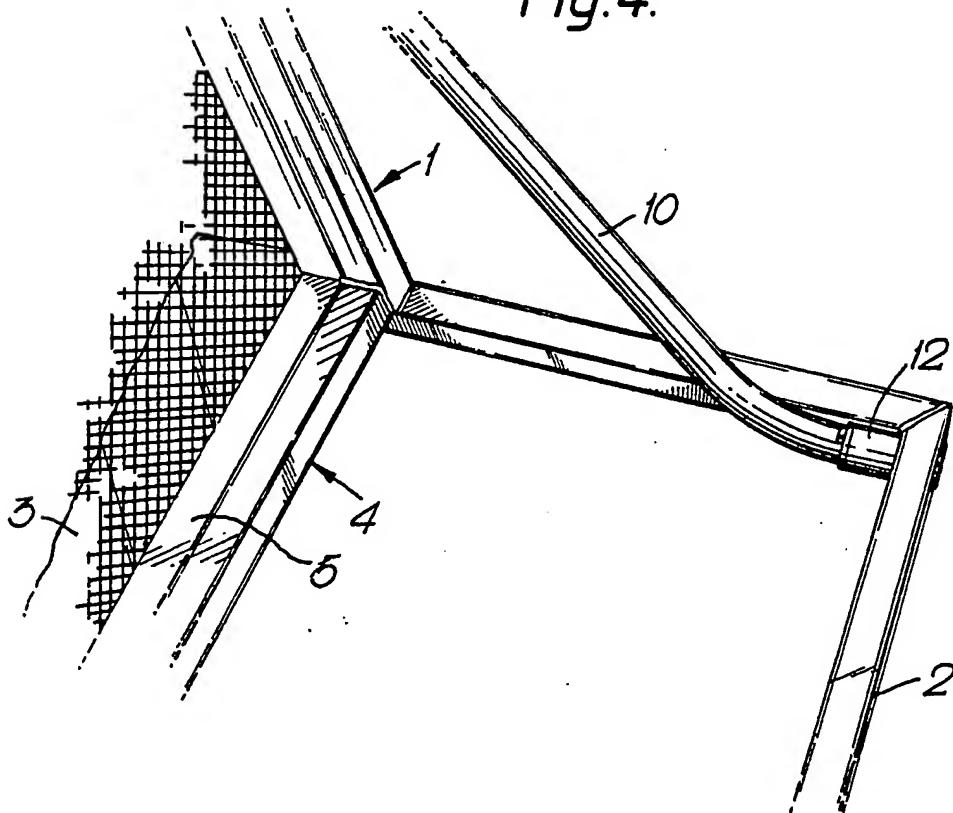
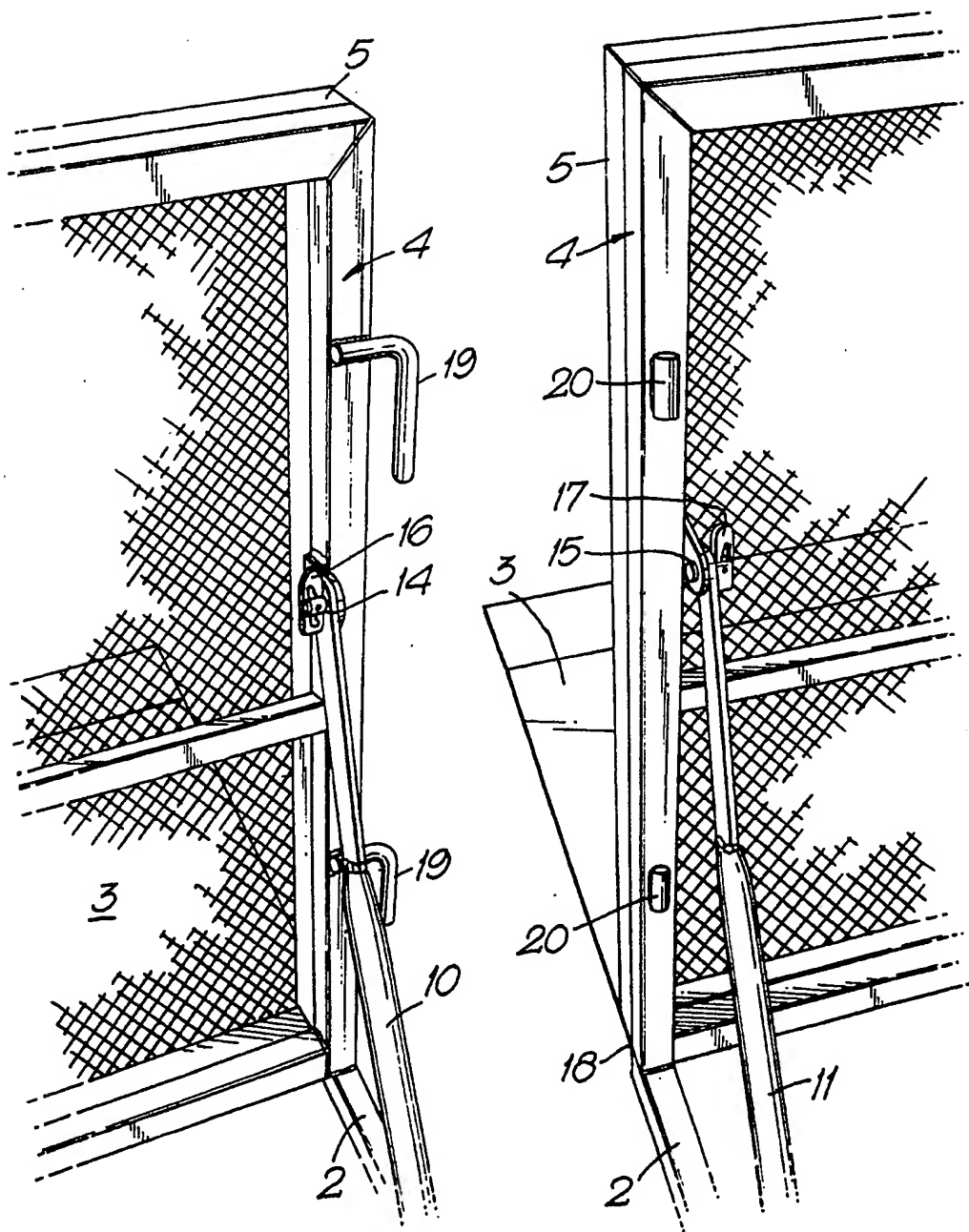


Fig. 5.



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PATENTS ACT 1977

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DESCRIPTION OF INVENTION

Improvements in or relating to a barrier.

THE PRESENT INVENTION relates to a barrier and more particularly relates to a barrier which can be utilized for restraining crowds.

It has been proposed previously to provide barriers for restraining crowds. Such barriers may be used at events such as pop-concerts, football matches, and other public events where large numbers of people are expected to gather whereby it is desired to prevent people from entering specific areas.

A typical barrier, as utilized at the present time, is formed of a number of transportable elements. Each element consists of a frame, which may contain wire mesh or which may contain an infill of plywood or the like. The frame is provided with feet to enable the frame to stand in a vertical condition, and also the frame is provided with means to engage an adjacent frame, so that a number of elements can be mounted side by side and connected together to form a barrier.

In order to provide the barrier with a degree of stability, the feet connected to the frame extend to either side of the frame. Nevertheless, the barriers that are presently in use are not very stable and may well fall over, especially if the barrier is utilized to restrain a very large crowd. Furthermore, the individual barrier elements are awkward to handle, since the feet tend to stick out from

the frame, and the elements are difficult to store, because of their awkward shape.

The present invention seeks to provide an improved barrier and more particularly seeks to provide an improved barrier element, which can be combined with similar elements to form the barrier.

According to the present invention there is provided a barrier element, said barrier element comprising a first frame to extend substantially vertically to form the barrier, a second frame to extend substantially horizontally adjacent one side of the barrier, to form a ground support, and means connecting the first frame and the second frame, and a plate, to lie adjacent the ground on the opposite side of the vertical frame from the second frame, means being provided to connect the plate to one of said frames.

Preferably wherein said plate is connected to the second horizontal frame.

Conveniently the plate is connected to the said frame by means of a hinge.

Advantageously the first frame is releasably connected to the second frame.

Preferably the first frame defines a plurality of projections adapted to be received in apertures formed on the second frame in order to releasably connect the first frame to the second frame.

Conveniently reinforcing struts are provided extending between the first frame and the second frame.

Advantageously the reinforcing struts are pivotably

connected to the second frame and are releasably connected to the first frame.

Preferably the struts are releasably connected to the first frame by means of locking tabs which pass through apertures formed at the free ends of the struts.

Conveniently the reinforcing struts are pivotally mounted on the second frame in such a way that they may be pivotally moved to be completely retained within the confines of the second frame.

Advantageously the barrier element is provided with means to engage cooperating means provided on a corresponding barrier element.

Preferably the engaging means comprise hook means provided on one side of the vertical frame and means defining recesses on the other side of the vertical frame adapted to receive the hook means of an adjacent frame.

The present invention also provides a barrier comprising a plurality of barrier elements as described above. Preferably the elements of the barrier are interconnected.

In order that the the invention may be more readily understood, and so that further features thereof may be appreciated, the invention will now be described, by way of example, with reference to the accompanying drawings in which:

FIGURE 1 is a perspective view of a barrier element in accordance with the invention when erected, from the rear;

FIGURE 2 is perspective view of the barrier of Figure 1

from the front with parts omitted for clarity;

FIGURE 3 is an enlarged perspective view of part of the barrier of Figures 1 and 2;

FIGURE 4 is an enlarged view showing part of a strut hinge; and

FIGURE 5 is an enlarged view showing an interconnecting means.

Referring initially to Figures 1 and 2 of the drawings a barrier element in accordance with the invention comprises three main components namely a vertical frame 1, a horizontal support frame 2, and a horizontal sheet 3.

The vertical frame 1 comprises the main component of the barrier. The frame 1 defines an inner square or rectangular aperture 4 which receives a further frame 5 on which is mounted a sheet or wire mesh or a panel of plywood, or some other infill. The frame 5 is then welded or otherwise secured to the frame 1. The frame 1 may have one or more transverse reinforcing bars, such as the reinforcing bar 6 (see Figure 2).

It is to be noted that, at the lower edge of the two sides of the frame 4 there are two downwardly extending projections 7.

The horizontal frame 2 is a rectangular frame which, in use, is adapted to lie on the ground. Adjacent two corners 8, 9 of the frame rectangular apertures are formed which receive the projections 7 formed on the vertical frame 2. The arrangement is such that when the frame 2 is horizontal, and the projections 7 are engaged with the apertures 8, 9, the frame 1 is maintained in the vertical position.

In order to help ensure that the frame 1 is maintained in the vertical position, reinforcing struts 10, 11 are provided. Each strut is formed, at least partly, of a tubular material, and is hingedly connected to part of the frame 2 at a position which is remote from the apertures 8 and 9 by means of hinges 12, 13 (see Figure 3 and 4). In the described embodiment the hinges are formed by the cylindrical housing which contain bearings which effectively enable part of the strut 10, 11 received within the housings to rotate. It will be appreciated that the free ends of the struts 10, 11 are flattened, so that the two struts can be hinged down to lie totally within a central aperture defined by the horizontal frame 2. When in the this condition, the struts do not extend above the upper surface of frame 2. However, when the struts 10, 11 have been hinged upwardly into an operative position, apertures 14, 15 formed at the ends of the struts 10, 11 can be engaged with locking tabs 16, 17 provided on the vertical frame 1. The vertical frame 1 is then restrained in the vertical position.

The horizontal frame 2 lies on the ground on one side of the vertical frame 1. On the other side of of the vertical frame 1 a sheet 3 lies on the ground. The sheet may be formed of metal or other suitable material, and is hingedly connected, adjacent the base of the frame 1, by means of a hinge 18.

It is to be appreciated that the sheet 3 is so formed that the edge thereof remote from the frame 1 engages the ground or floor, and the sheet then slopes upwardly towards the base of the frame 1. Feet may be provided on the underside of the sheet 3 for engaging the ground at positions between the free edge of the sheet and the frame 1.

The frame 1 is provided, on one side thereof, with two hook-like elements 19 adapted to engage two recesses 20 provided on the other side of a similar frame. Thus a plurality of elements as described can be interconnected to form a barrier.

It is to be understood that when the barrier is in use, the barrier will be erected so that the crowd to be restrained by the barrier are on the side of the barrier on which the sheet 3 is provided. Thus, when the barrier is in use it is envisaged that a significant number of people will be standing on the sheet whenever any force is applied to the frame 1 tending to tip the barrier over. Of course, if the barrier is to be tipped over, the sheet 3 will have to be raised, and due to the weight exerted down on the sheet 3 by the people standing on it, it is thought that it will be impossible to tip the described barrier over.

When the barrier is no longer required, the barrier can be collapsed. Initially the struts 10 and 11 will be disconnected from the locking tabs formed on the frame 1, and will be pivoted down to lie within the confines of the horizontal frame 2. The frame 1 may then be lifted, disengaging the projections 7 from the apertures 8 and 9. The frame 1 is then a substantially flat frame, and can be stacked with similar frames for easy transportation and storage. The sheet 3, which is hingedly connected to the frame 2 may then be moved, about the hinge, so that the sheet 3 is superimposed on the frame 2. The combination of the frame 2 and the sheet 3 is thus compact, and again can be stacked with similar components for easy transportation and storage.

It will be appreciated, therefore, that the preferred embodiment of the invention provides a barrier which, in use, is well able to withstand pressures applied to the

barrier by a crowd. As a consequence of the fact that when pressure is applied to the barrier people will be standing on the sheet or platform 3, it is thought that there is no risk of the barrier tipping over. However, when the barrier is no longer required, the barrier can be collapsed in a straightforward manner, can be transported in a straightforward manner, and can be stored in a straightforward manner. It is not necessary to employ skilled labour either to install the barrier or to collapse the barrier.

CLAIMS:

1. A barrier element, said barrier element comprising a first frame to extend substantially vertically to form the barrier, a second frame to extend substantially horizontally adjacent one side of the barrier, to form a ground support, and means connecting the first frame and the second frame, and a plate, to lie adjacent the ground on the opposite side of the vertical frame from the second frame, means being provided to connect the plate to one of said frames.
2. A barrier element according to Claim 1 wherein said plate is connected to the second horizontal frame.
3. A barrier element according to Claim 1 or 2 wherein the plate is connected to the said frame by means of a hinge.
4. A barrier element according to any one of the preceding claims wherein the first frame is releasably connected to the second frame.
5. A barrier element according to Claim 4 wherein the first frame defines a plurality of projections adapted to be received in apertures formed on the second frame in order to releasably connect the first frame to the second frame.
6. According to any one of the preceding claims wherein reinforcing struts are provided extending between the first frame and the second frame.
7. A barrier element according to Claim 6 wherein the reinforcing struts are pivotably connected to the second frame and are releasably connected to the first frame.
8. A barrier element according to Claim 8 wherein the struts are releasably connected to the first frame by means

of locking tabs which pass through apertures formed at the free ends of the struts.

9. A barrier element according to any one of Claims 6 to 8 wherein the reinforcing struts are pivotally mounted on the second frame in such a way that they may be pivotally moved to be completely retained within the confines of the second frame.

10. A barrier element according to any one of the preceding claims provided with means to engage cooperating means provided on a corresponding barrier element.

11. A barrier element according to Claim 10 wherein said engaging means comprise hook means provided on one side of the vertical frame and means defining recesses on the other side of the vertical frame adapted to receive the hook means of an adjacent frame.

12. A barrier comprising a plurality of barrier elements according to any one of the preceding claims.

13. A barrier according to Claim 12 wherein the elements of the barrier are interconnected.

14. A barrier element substantially as herein described with reference to and as shown in the accompanying drawings.

15. Any novel feature or combination of features disclosed herein.